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Fungi may provide greener way of controlling oilseed rape diseases

A new study from Poland has confirmed the potential of fungal *Trichoderma* species to control diseases of oilseed rape crops. The use of *Trichoderma* can reduce the growth of disease-causing oilseed rape pathogens, which may allow a decrease in the use of harmful pesticides.

The production of oilseed rape is growing at one of the fastest rates of all crops globally and the EU currently produces the highest amount of rape seeds and oil in the world. Fungi, such as *Leptosphaeria maculans* and *Leptosphaeria biglobosa,* are the most damaging pathogens of oilseed rape crops and both cause a type of leaf spotting called phoma, and stem canker, also known as blackleg. These diseases can lead to significant yield losses and, therefore, economic losses in areas of intensive rapeseed cultivation.

These diseases can be controlled by chemical treatments. However, EU policy for integrated pest management encourages the use of biological control (biocontrol) methods to combat pathogens in order to increase the sustainability of pesticide use.

In this study, researchers tested the suitability of species of *Trichoderma* fungi to control stem canker and phoma leaf spotting in oilseed rape. *Trichoderma* fungi are a potent group of biocontrol agents that can interfere with pathogen growth, survival and reduce crop plant infection. They can directly attack other fungal pathogens and also produce substances which can inhibit their growth – known as antibiosis.

Laboratory experiments were carried out to evaluate the growth of *Trichoderma* under different conditions. Field experiments in Cerekwica, Poland, also investigated the potential of a spray of *Trichoderma* spores to decrease phoma leaf spotting. The reaction of *Trichoderma* to a fungicide commonly used against stem canker was also assessed.

Trichoderma harzianum was found to be the most effective biocontrol species as it not only reduced the growth of oilseed rape pathogens in laboratory tests, but also demonstrated signs of antibiosis by inhibiting further pathogen growth. This species was also most resistant to flusilazole — an active substance of fungicides commonly used to treat fungal pathogens.

Using *Trichoderma* species that are resistant to fungicides means that both biological and chemical controls can be used on crop pathogens. Fungicides can weaken the pathogen and make them more susceptible to attack by biocontrols. The laboratory experiments indicated that *L. maculans* and *L. biglobosa* were susceptible to flusilazole, which is one of the most common and effective components of chemical treatments against phoma leaf spotting and stem canker. The researchers found that *T. harzianum*, *T. hamatum* and *T. longibrachiatum* were all resistant towards flusilazole.

Combining fungicides and biocontrols, which are resistant to chemical treatments, also means that reduced amounts of fungicide are needed and the use of the most harmful pesticides can be avoided. This approach could therefore reduce the impact of chemical treatments on the environment. The researchers say that future research should concentrate on identifying biocontrol agents, such as *Trichoderma,* which are capable of reducing initial development of pathogens as well as controlling their spread within crops.

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